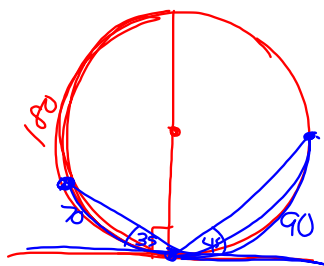
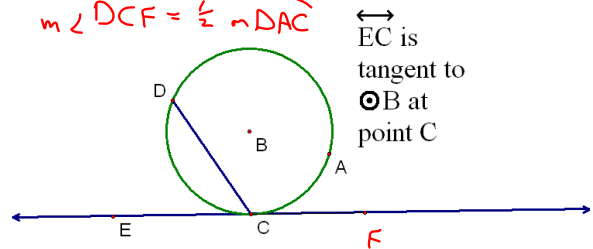


10-5 Apply Other Angle Relationships in Circles

Theorem 10.11--If a tangent and a chord intersect at a point on a circle, then the measure of each angle formed is one half the measure of its intercepted arc.

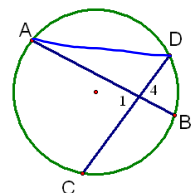
$$m\angle DCE = \frac{1}{2} m\widehat{DC}$$

$$m\angle DCF = \frac{1}{2} m\widehat{DAC}$$



Given: picture

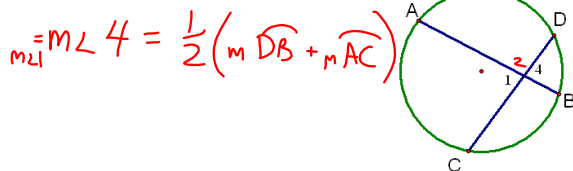
Prove: $m\angle 4 = \frac{1}{2}(m\widehat{AC} + m\widehat{DB})$



- | | |
|--|---|
| ① ~ | ① Given |
| ② Draw \overline{AD} | ② Through any 2 pts there exists exactly one line |
| ③ $m\angle 4 = m\angle A + m\angle D$ | ③ Ext \angle of \triangle thm |
| ④ $m\angle A = \frac{1}{2} m\widehat{DB}$
$m\angle D = \frac{1}{2} m\widehat{AC}$ | ④ Measure of an Inscribed \angle Thm |
| ⑤ $m\angle 4 = \frac{1}{2} m\widehat{DB} + \frac{1}{2} m\widehat{AC}$ | ⑤ Subst. |
| ⑥ $m\angle 4 = \frac{1}{2} (m\widehat{DB} + m\widehat{AC})$ | ⑥ Subst. |
| ⑦ $m\angle 4 = \frac{1}{2} (m\widehat{AC} + m\widehat{DB})$ | ⑦ Commutative |

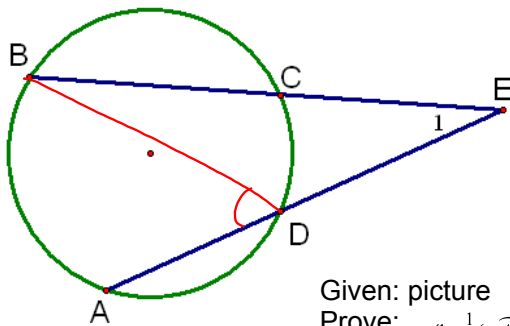
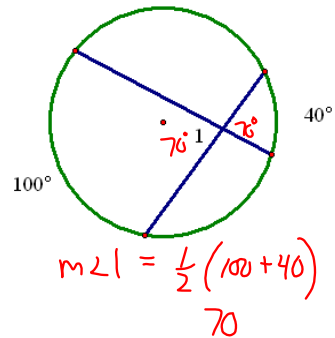
Theorem 10-12--Angles Inside the Circle

Theorem--The measure of an angle formed on the **inside** of a circle (by 2 secants or 2 chords) is half the **sum** of the measures of the intercepted arcs.



gsp

Find the measure of the angle.



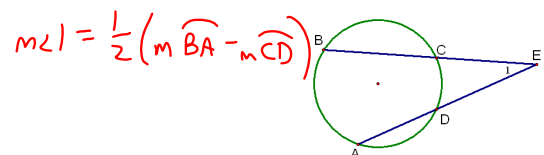
Given: picture

Prove: $m\angle 1 = \frac{1}{2}(m\widehat{AB} - m\widehat{DC})$

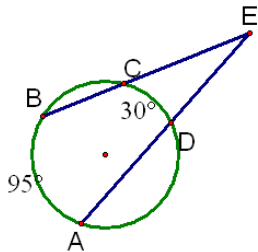
$$\begin{aligned} m\angle B &= \frac{1}{2} m\widehat{CD} \\ m\angle BDA &= \frac{1}{2} m\widehat{BA} \\ m\angle BDA &= m\angle B + m\angle 1 \\ m\angle BDA - m\angle B &= m\angle 1 \\ \frac{1}{2}(m\widehat{BA} - m\widehat{CD}) &= m\angle 1 \end{aligned}$$

Theorem 10-13--Angles Outside the Circle

Theorem--The measure of an angle formed on the **outside** of a circle (by 2 secants, 2 tangents, or secant and a tangent) is half the **difference** of the measures of the intercepted arcs.



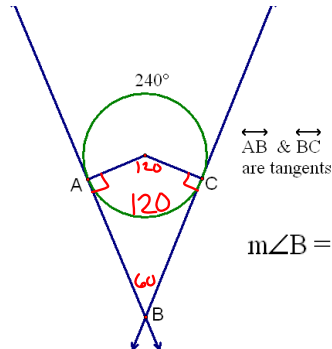
gsp



$$m\angle E =$$

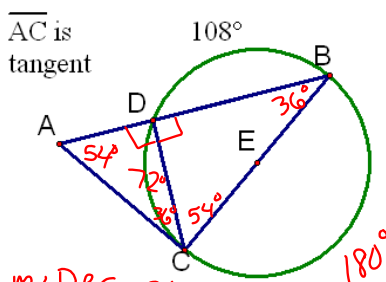
$$\frac{1}{2}(95 - 30)$$

$$32.5^\circ$$



$$m\angle B = \frac{1}{2}(240 - 120)$$

$$= 60$$



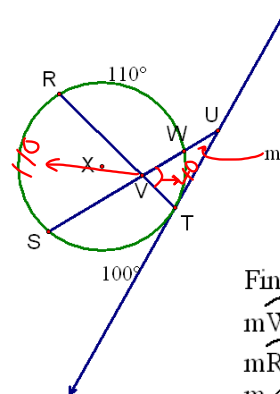
$$m\angle DBC = 36^\circ$$

$$m\angle BDC = 90$$

$$m\angle DCB = 54$$

$$m\angle A = \frac{1}{2}(180 - 72)$$

$$54^\circ$$



$$30 = \frac{1}{2}(100 - \widehat{UT})$$

$$60 = 100 - \widehat{UT}$$

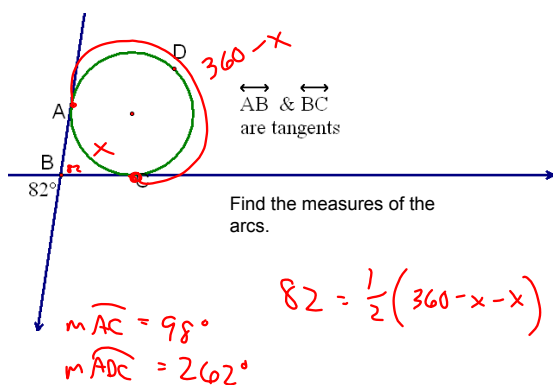
Find

$$m\widehat{WT} = 40^\circ$$

$$m\widehat{RS} = 110^\circ$$

$$m\angle WVT = 75^\circ$$

$$m\angle RVW = 105^\circ$$



HW

p683-685

#s 3-11, 16a, 17,
18, 20, 21

Attachments

10_6_gsp_example.gsp